

REMARKS/ARGUMENTS

Favorable reconsideration of this application, in view of the above amendments and in light of the following discussion, is respectfully requested.

Claims 11, 12, 14-16, and 19-25 are pending. In the present amendment, Claims 11, 12, 14-16, 19, and 20 are currently amended, Claims 13, 17, and 18 are canceled without prejudice or disclaimer, and new Claims 21-25 are added. Support for the present amendment can be found in the original specification, for example, at page 7, line 11 to page 9, line 14, at page 9, line 31 to page 11, line 3, in Figures 1-4, and in original Claims 1-10. Thus, it is respectfully submitted that no new matter is added.

In the outstanding Office Action, Claims 11 and 16-18 were rejected under 35 U.S.C. § 102(b) as anticipated by Endo et al. (U.S. Publication No. 2002/0043423, hereinafter “Endo”); Claims 12-15 and 19 were rejected under 35 U.S.C. § 103(a) as unpatentable over Endo in view of Kurishige et al. (U.S. Patent No. 6,450,287, hereinafter “Kurishige”); and Claim 20 was rejected under 35 U.S.C. § 103(a) as unpatentable over Endo in view of Kurishige, and further in view of Stout et al. (U.S. Publication No. 2004/0064229, hereinafter “Stout”).

The specification is hereby amended to add applicable section headings and to correct a minor informality. It is respectfully submitted that no new matter is added.

Turning now to the rejections under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a), Applicants respectfully request reconsideration of these rejections and traverse these rejections, as discussed below.

Independent Claim 11 recites a method of assisting steering of steered wheels of a vehicle. The method comprises calculating an angular speed and an angular acceleration of a steering wheel of the vehicle and comparing the calculated speed and acceleration to speed and acceleration thresholds. When the calculated speed and acceleration are greater than the

respective speed and acceleration thresholds, a phase advance is applied between the steering wheel and a rack element to decrease response time of the vehicle to an action of a driver of the vehicle on the steering wheel. Thus, a driver is given greater control of the vehicle, for example, during an emergency lane change.

The recited method calculates both the angular speed and the angular acceleration of the steering wheel itself. Further, the calculated speed and acceleration of the steering wheel is then compared to a threshold speed and a threshold acceleration to determine if a phase advance should be applied. A vehicle implementing this method of assisted steering is more reactive with reduced amplitudes of angles of the steering wheel and is controlled more readily with lower angles of drift.¹

It is respectfully submitted that the cited references do not disclose or suggest every feature recited in independent Claim 11.

Endo describes a control unit for an electric power steering apparatus that is designed to improve the responsiveness of the assist torque. As acknowledged in the second paragraph on page 4 of the Office Action, Endo does not disclose or suggest measuring or estimating the speed of rotation and the angular acceleration of a steering wheel. Instead, the Office Action relies on Kurishige to cure this deficiency of Endo.

Kurishige teaches an electric power steering controller that detects a steering torque and provides a torque assistance based on the detected steering torque.² The system of Kurishige also comprises a steering torque controller 2 that corrects the phase of the steering torque signal to improve the frequency characteristics of the steering torque signal.³ Further, when the detected steering torque signal is below a certain threshold, the system of Kurishige uses “0” as the steering torque signal.⁴

¹ See the original specification, for example, at page 11, lines 5-14.

² See Kurishige, at column 9, line 58 to column 10, line 8 and in Figure 4.

³ See Kurishige, at column 10, lines 19-35.

⁴ See Kurishige, at column 18, lines 26-42.

However, it is respectfully submitted that Kurishige does not disclose or suggest “calculating an angular speed and an angular acceleration of a steering wheel of the vehicle; comparing the angular speed of the steering wheel to a threshold speed; comparing the angular acceleration of the steering wheel to a threshold acceleration,” as recited in amended Claim 11.

Instead, as discussed above, Kurishige only describes *detecting a torque* of the steering wheel and comparing this torque to a *threshold torque measurement*. Thus, Kurishige is completely silent with regards to detecting an *angular speed* of the steering wheel or comparing the angular speed of the steering wheel to a *threshold speed*. Further, although angular acceleration of the steering wheel can be used as part of the equation to determine the steering torque, Kurishige is silent with regards to measuring the angular acceleration of the steering wheel.

Additionally, even assuming that the system of Kurishige does measure the angular acceleration of the steering wheel to determine the steering wheel torque, Kurishige does not disclose or suggest *comparing* the angular acceleration of the steering wheel *to a threshold angular acceleration*. As there are other variables involved in determining the torque of the steering wheel, comparing a measured torque with a threshold torque as in Kurishige is not the same as comparing accelerations. Specifically, the system in Kurishige could measure two different torques, one below the torque threshold and one above the torque threshold, that were generated from identical accelerations of the steering wheel.

Therefore, it is respectfully submitted that Kurishige does not cure the above-noted deficiencies of Endo. Thus, it is respectfully requested that the rejections of Claim 11, and all claims dependent thereon, as anticipated by Endo and as unpatentable over Endo in view of Kurishige be withdrawn.

Claim 14 is dependent on Claim 11, and thus is believed to be patentable over Endo and Kurishige for at least the reasons discussed above with respect to Claim 11. Further Claim 14 recites that the steering preset that is sent to the actuator is calculated according to the following equation: $\alpha_c(t) = \alpha(t) + t_1\alpha_1(t) + t_1^2\alpha_2(t)/2$. Applicants respectfully submit that the cited references do not disclose or suggest adjusting the steering preset according to the claimed equation. Accordingly, Claim 14 is believed to further define over the cited references.

Independent Claim 16 recites a system for assisting steering of steered wheels of a vehicle. The system of Claim 16 comprises “a sensor to measure an angular speed and an angular acceleration of a steering wheel of the vehicle; and a control unit to compare the angular speed of the steering wheel to a threshold speed and to compare the angular acceleration of the steering wheel to a threshold acceleration.” Accordingly, in view of the above discussion of Endo and Kurishige, it is respectfully submitted that Endo alone, or in combination with Kurishige, does not disclose or suggest every feature recited in amended Claim 16. Thus, it is respectfully requested that the rejections of Claim 16, and all claims dependent thereon, as anticipated by Endo and as unpatentable over Endo in view of Kurishige be withdrawn.

Turning now to the rejection of Claim 20, it is noted that Claim 20 is dependent on independent Claim 16, and thus it is believed to be patentable over Endo and Kurishige for at least the reasons discussed above with respect to Claim 16. Further, Applicants respectfully submit that Stout does not cure the above noted deficiencies of Endo and Kurishige. Accordingly, it is respectfully requested that the rejection of Claim 20 as unpatentable over Endo in view of Kurishige and further in view of Stout be withdrawn.

New Claims 21-25 are added by the present amendment. Support for new Claims 21-25 can be found in the original specification, for example, at page 7, line 11 to page 9, line

14, at page 9, line 31 to page 11, line 3, in Figures 1-4, and in original Claims 1-10. Thus, it is respectfully submitted that no new matter is added.

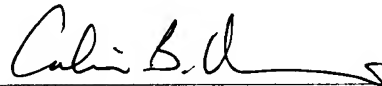
As new Claims 21-25 depend on independent Claims 11 and 16, Applicants respectfully submit that Claims 21-25 patentably define over the cited references for at least the reasons discussed above with respect to Claims 11 and 16.

Additionally, Claim 24 recites that the steer angle present is calculated according to the following equation: $\alpha_c(t) = \alpha(t) + t_1\alpha_1(t) + t_1^2\alpha_2(t)/2$. Applicants respectfully submit that the cited references do not disclose or suggest adjusting the steering preset according to the claimed equation. Accordingly, Claim 24 is believed to further define over the cited references.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application and the present application is believed to be in condition for formal allowance. A Notice of Allowance is earnestly solicited.

Respectfully submitted,

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